



BASED GENERAL AVIATION AIRCRAFT FORECASTS AT SYSTEM PLAN AIRPORTS

Based aircraft were forecast by holding constant the marketshare of aircraft based in a given county in 2000 to the number of aircraft registered in that county. Based aircraft forecasts for each airport are included in **Table 1J. Exhibit F** depicts based aircraft forecasts by region.

GENERAL AVIATION SYSTEM PLAN FLEET MIX

The based aircraft figures for each airport are presented by aircraft type, also known as “fleet mix.” With regard to multi-engine based aircraft forecasts, the FAA 5010 data do not distinguish between multi-engine piston and turboprop aircraft, but instead, reports both as multi-engine aircraft. To remedy this, 1990 through 1994 editions of *Census of U.S. Civil Aircraft* were reviewed to determine the historical breakdown of multi-engine aircraft in each Washington county. The percentage of piston versus turbine-powered multi-engine aircraft for each county was then applied to the multi-engine aircraft based at airports within that county. This information was utilized to create a categorical breakdown of these aircraft for the baseline year 2000 data. To forecast twin-piston and turboprop based aircraft, the *FAA Aerospace Forecasts, 2000-2011* annual growth rates were utilized to forecast both categories of aircraft. It was concluded that twin-piston growth would remain static/constant, while turboprop aircraft growth and utilization are expected to increase steadily over the 20-year forecast period. In forecasting the fleet mix for each airport, it was assumed that single-engine aircraft would be responsible for much of the growth in based aircraft. Each airport’s location and number of based aircraft was reviewed to determine if a change in fleet mix was warranted. The fleet mix for each airport has been included in **Appendix A**.

GENERAL AVIATION OPERATIONS

An operation is defined as a take off or landing. **Table 1K** depicts the forecast of annual operations for airports included in the study, while **Exhibit G** depicts these forecasts by region. Historical information regarding annual operations for each system plan airport was obtained from FAA Form 5010 for each airport. The utilization rate (operations per based aircraft) was obtained by dividing the total number of general aviation operations (air taxi, and local and itinerant general aviation operations) at each airport by the number of based aircraft. A variety of factors can be responsible for a change in the number of annual operations. Therefore, unless specific conditions were noted, the utilization rate at each airport was increased uniformly by 0.3 for 2005, 0.33 percent for 2010, .36 percent for 2015, and 0.39 percent for year 2020. These figures were then multiplied by forecast based aircraft figures to arrive at forecast general aviation operations at each airport.

Table 1L lists the system airports which were initially reported to have no baseline annual operations or based aircraft. While each of these airports, mostly seaplane bases, are small ARC A-I facilities, it was





TABLE 1J
BASED AIRCRAFT FORECASTS

Associated City	Airport Name	2000*	2005	2010	2015	2020
ARC A-I						
Anacortes	Anacortes	55	55	56	56	56
Anacortes	Skyline SPB	0	0	0	0	0
Auburn	Auburn Municipal	230	244	258	270	282
Bellingham	Floathaven SPB	9	9	9	9	11
Bellingham	Port of Bellingham SPB	0	0	0	0	0
Blaine	Blaine Municipal	16	16	16	16	20
Bremerton	Bremerton SPB	0	0	0	0	0
Camas	Grove Field	66	78	89	98	106
Cashmere	Cashmere Dryden	54	54	55	55	56
College Place	Martin Field	32	32	33	33	33
Concrete	Concrete Municipal	24	24	24	24	25
Darrington	Darrington Municipal	3	3	4	4	5
Elma	Elma Municipal	25	25	26	26	26
Friday Harbor	Friday Harbor SPB	0	0	0	0	0
Kenmore	Kenmore Air Harbor, Inc. SPB	100	106	112	117	122
Mattawa	Desert Aire	9	9	9	9	9
Mead	Mead Flying Service	25	26	26	27	28
Morton	Strom Field	7	7	7	7	7
Omak	Omak	9	10	10	12	15
Othello	Othello Municipal	14	14	15	15	15
Port Orchard	Port Orchard	0	0	0	0	0
Poulsbo	Poulsbo SPB	0	0	0	0	0
Quincy	Quincy Municipal	4	4	4	4	4
Renton	Will Rogers Wiley Post SPB	0	0	0	0	0
Ritzville	Pru Field	7	7	7	7	7
Roche Harbor	Roche Harbor SPB	0	0	0	0	0
Rosalia	Rosalia Municipal	9	9	9	9	9
Rosario	Rosario SPB	0	0	0	0	0
Seattle: Lake Union	Kenmore Air Harbor SPB	0	0	0	0	0
Sekiu	Sekiu	2	2	2	2	2



**TABLE 1J
BASED AIRCRAFT FORECASTS**

Associated City	Airport Name	2000*	2005	2010	2015	2020
Silverdale	Apex Airpark	55	71	87	100	113
Tacoma	American Lake SPB	15	17	19	21	22
Tacoma	Eleventh Street Waterway SPB	0	0	0	0	0
Vashon	Vashon Municipal	30	32	34	35	37
ARC A-II						
Lopez	Lopez Island	30	30	30	36	42
Packwood	Packwood	2	2	2	2	2
Vancouver	Evergreen Field	150	177	203	223	242
Winthrop	Methow Valley	7	7	7	7	7
ARC B-I						
Arlington	Arlington Municipal	453	528	595	648	694
Battle Ground	Goheen	39	46	53	58	63
Brewster	Anderson Field	9	9	9	9	9
Chehalis	Chehalis Centralia	66	67	67	68	68
Chelan	Chelan Municipal	54	54	55	55	56
Cle Elum	Cle Elum Municipal	6	6	6	6	6
Cle Elum	DeVere Field	0	0	0	0	0
Colfax	Whitman County Memorial	14	14	14	14	14
Colville	Colville Municipal	30	30	31	31	31
Dallesport	Columbia Gorge Reg./The Dalles Mun.	43	43	44	44	45
Davenport	Davenport	9	9	9	9	9
Eastsound	Orcas Island	74	74	75	90	104
Eatonville	Swanson	18	20	23	25	27
Electric City	Grand Coulee Dam	6	6	6	6	6
Ephrata	Ephrata Municipal	35	35	35	36	36
Forks	Forks	6	6	6	6	6
Forks	Quillayute	2	5	7	7	9
Friday Harbor	Friday Harbor	114	115	115	138	160
Goldendale	Goldendale	4	4	4	4	4
Ilwaco	Port of Ilwaco	0	0	0	0	0
Ione	Ione Municipal	5	5	6	6	6
Kelso	Kelso-Longview	90	92	93	145	194
Langley	Whidbey Airpark	16	23	31	37	43





**TABLE 1J
BASED AIRCRAFT FORECASTS**

Associated City	Airport Name	2000*	2005	2010	2015	2020
Lind	Lind	5	7	10	12	13
Lynden	Lynden	29	29	29	30	36
Mansfield	Mansfield	0	0	0	0	0
Monroe	Firstair Field	70	82	92	100	107
Moses Lake	Moses Lake Municipal	27	27	27	27	28
Ocean Shores	Ocean Shores Municipal	0	0	0	0	0
Odessa	Odessa Municipal	10	10	10	10	11
Okanogan	Okanogan Legion	12	12	12	12	12
Oroville	Dorothy Scott Municipal	19	19	19	19	19
Port Townsend	Jefferson County International	112	113	114	115	116
Prosser	Prosser	25	25	25	31	36
Roche Harbor	Roche Harbor	9	9	9	11	13
Snohomish	Harvey Field	385	448	505	551	590
Spanaway	Spanaway	62	70	79	86	92
sunnyside	Sunnyside Municipal	20	20	20	25	29
Tekoa	Willard Field	10	10	10	10	10
Twisp	Twisp Municipal	18	18	18	18	18
Vancouver	Fly For Fun	10	12	14	15	16
Warden	New Warden	4	4	4	4	4
Waterville	Waterville	14	14	14	14	15
Westport	Westport	3	3	3	3	3
Wilbur	Wilbur Municipal	22	22	23	23	23
ARC B-II						
Bremerton	Bremerton National	150	173	213	232	261
Burlington/ Mt. Vernon	Skagit Regional	120	121	122	122	123
Chewelah	Sand Canyon	16	16	16	16	17
Deer Park	Deer Park	78	88	98	107	115
Ellensburg	Bowers Field	51	52	53	53	54
Hoquiam	Bowerman Field	30	30	31	31	31
Kennewick	Vista Field	40	40	41	50	58
Kent	Crest Airpark	330	350	370	387	404
Port Angeles	Wm. R. Fairchild International	71	72	72	73	73





**TABLE 1J
 BASED AIRCRAFT FORECASTS**

Associated City	Airport Name	2000*	2005	2010	2015	2020
Puyallup	Pierce County/Thun Field	231	260	293	319	344
Renton	Renton Municipal	284	301	319	333	348
Republic	Ferry County	10	10	12	12	14
Richland	Richland	67	67	68	83	98
Sequim	Sequim Valley	30	30	30	31	31
Shelton	Sanderson Field	51	52	53	54	55
Toledo	Toledo-Winlock Ed Carlson Mem. Field	38	38	39	39	39
Tonasket	Tonasket Municipal	9	9	9	9	9
Vancouver	Pearson Field	197	232	266	293	318
ARC B-III						
Wenatchee	Pangborn Memorial	111	112	114	115	116
ARC C-I						
Tacoma	Tacoma Narrows	170	191	215	235	253
ARC C-II						
South Bend	Willapa Harbor	4	4	4	5	5
Olympia	Olympia	178	230	281	323	363
ARC C-III						
Spokane	Felts Field	321	360	403	440	475
Bellingham	Bellingham International	175	176	177	178	215
Pasco	Tri-Cities	80	81	82	82	83
Pullman/ Moscow	Pullman/Moscow Regional	63	63	64	64	65
Spokane	Spokane International	114	128	143	156	169
Yakima	Yakima Air Terminal	115	116	116	117	117
ARC C-IV						
Walla Walla	Walla Walla Regional	154	155	157	158	159
ARC D-IV						
Seattle	Boeing Field/ King County International	466	494	523	547	571
ARC D-V						
Everett	Snohomish County/Paine Field	494	575	648	707	756
Moses Lake	Grant County	84	84	85	85	86
Seattle	Seattle-Tacoma International	6	6	6	6	6

* Source: FAA Form 5010





Based Aircraft by Region

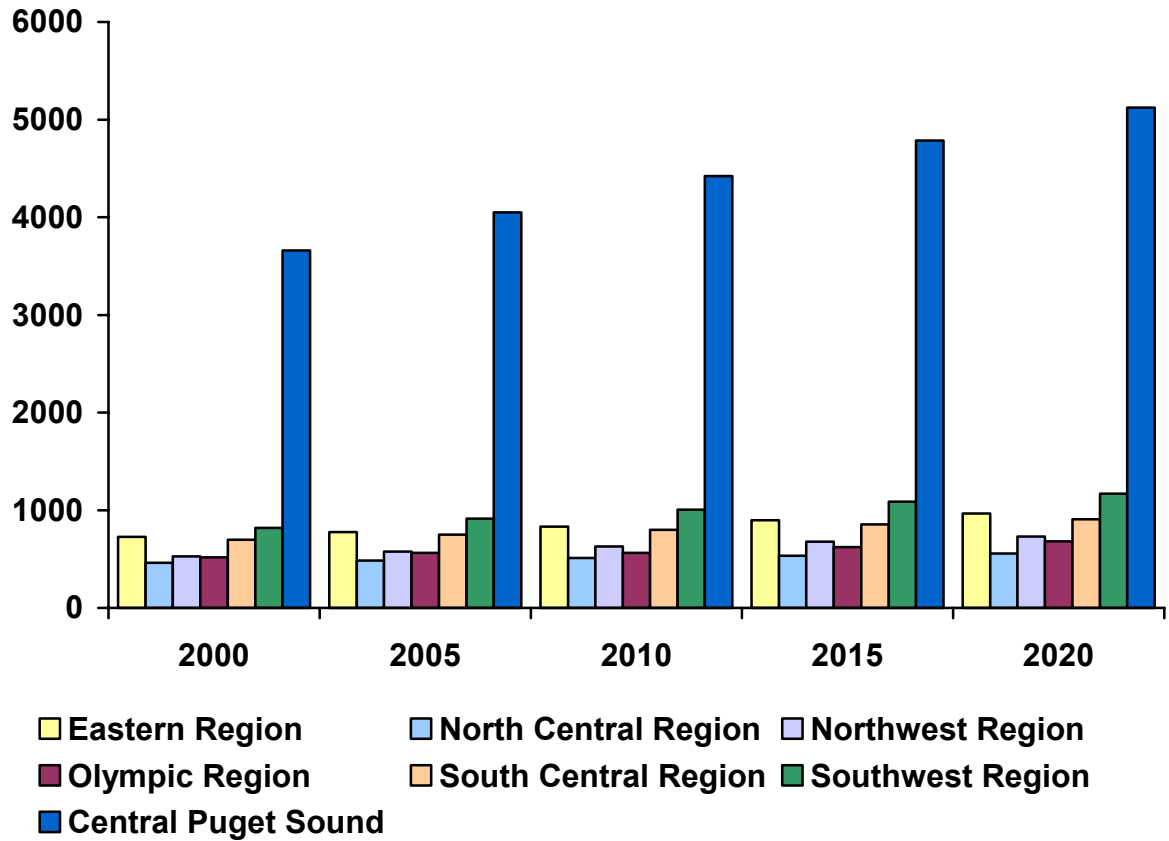




TABLE 1K
GENERAL AVIATION AIRCRAFT OPERATIONS AIRCRAFT FORECASTS**

Associated City	Airport Name	2000	2005	2010	2015	2020
ARC A-I						
Anacortes	Anacortes	21,500	21,600	22,000	22,100	22,200
Anacortes	Skyline SPB	50	2,107	2,112	2,117	2,122
Auburn	Auburn Municipal	171,900	182,900	194,000	203,800	213,700
Bellingham	Floathaven SPB	300	300	300	300	400
Bellingham	Port of Bellingham SPB	2,500	2,500	2,500	2,500	2,500
Blaine	Blaine Municipal	5,100	5,100	5,100	5,200	6,500
Bremerton	Bremerton SPB	2,500	2,500	2,500	2,500	2,500
Camas	Grove Field	5,000	5,900	6,800	7,500	8,100
Cashmere	Cashmere Dryden	11,150	11,200	11,400	11,500	11,700
College Place	Martin Field	2,500	2,500	2,500	2,500	2,500
Concrete	Concrete Municipal	6,750	6,800	6,800	6,800	7,100
Darrington	Darrington Municipal	3,025	3,000	4,100	4,100	5,100
Elma	Elma Municipal	12,000	12,000	12,600	12,600	12,700
Friday Harbor	Friday Harbor SPB	4,600	27,224	27,766	27,523	26,330
Kenmore	Kenmore Air Harbor, Inc. SPB	16,000	17,000	18,000	18,900	19,800
Mattawa	Desert Aire	600	600	600	600	600
Mead	Mead Flying Service	8,800	9,200	9,200	9,600	10,000
Morton	Strom Field	12,000	12,000	12,100	12,100	12,200
Omak	Omak	18,800	21,000	21,000	25,300	31,800
Othello	Othello Municipal	30,000	30,100	32,300	32,500	32,600
Port Orchard	Port Orchard	2,500	2,500	2,500	2,500	2,500
Poulsbo	Poulsbo SPB	275	2,564	2,569	2,574	2,579
Quincy	Quincy Municipal	3,400	3,400	3,400	3,400	3,400
Renton	Will Rogers Wiley Post SPB	2,387	6,799	6,804	6,809	6,814
Ritzville	Pru Field	4,500	4,500	4,500	4,500	4,600
Roche Harbor	Roche Harbor SPB	2,500	2,500	2,500	2,500	2,500
Rosalia	Rosalia Municipal	7,200	7,200	7,200	7,300	7,300
Rosario	Rosario SPB	312	6,522	7,229	7,936	8,602
Seattle: Lake Union	Kenmore Air Harbor SPB	30,500	30,500	30,500	30,500	30,500
Sekiu	Sekiu	1,000	1,000	1,000	1,000	1,000





TABLE 1K
GENERAL AVIATION AIRCRAFT OPERATIONS AIRCRAFT FORECASTS**

Associated City	Airport Name	2000	2005	2010	2015	2020
Silverdale	Apex Airpark	19,600	25,400	31,200	36,000	40,800
Tacoma	American Lake SPB	700	800	900	1,000	1,000
Tacoma	Eleventh Street Waterway SPB	2,500	2,500	2,500	2,500	2,500
Vashon	Vashon Municipal	7,000	7,500	8,000	8,200	8,800
ARC A-II						
Lopez	Lopez Island	31,000	31,100	31,200	37,600	44,000
Packwood	Packwood	8,500	8,500	8,600	8,600	8,600
Vancouver	Evergreen Field	200,000	236,700	272,400	300,300	327,100
Winthrop	Methow Valley	7,600	7,600	7,600	7,700	7,700
ARC B-I						
Arlington	Arlington Municipal	129,450	151,300	171,100	187,000	201,100
Battle Ground	Goheen	1,620	1,900	2,200	2,400	2,700
Brewster	Anderson Field	18,900	19,000	19,000	19,100	19,200
Chehalis	Chehalis Centralia	18,220	18,600	18,600	19,000	19,000
Chelan	Chelan Municipal	3,000	3,000	3,100	3,100	3,200
Cle Elum	Cle Elum Municipal	5,000	5,000	5,000	5,000	5,100
Cle Elum	DeVere Field	2,758	0	0	0	0
Colfax	Whitman County Memorial	11,000	11,000	11,100	11,100	11,200
Colville	Colville Municipal	19,200	19,300	20,000	20,000	20,100
Dallesport	Columbia Gorge Reg./The Dalles Mun.	5,100	5,100	5,300	5,300	5,400
Davenport	Davenport	7,000	7,000	7,000	7,100	7,100
Eastsound	Orcas Island	43,343	43,500	44,200	53,200	61,800
Eatonville	Swanson	5,579	6,200	7,200	7,800	8,500
Electric City	Grand Coulee Dam	11,000	11,000	11,100	11,100	11,200
Ephrata	Ephrata Municipal	20,200	20,300	20,300	21,000	21,100
Forks	Forks	13,550	13,600	13,600	13,700	13,700
Forks	Quillayute	450	1,300	1,800	1,800	2,300
Friday Harbor	Friday Harbor	67,057	67,800	68,100	82,000	95,400
Goldendale	Goldendale	5,100	5,100	5,100	5,200	5,200
Ilwaco	Port of Ilwaco	4,800	0	0	0	0
Ione	Ione Municipal	2,700	2,700	3,300	3,300	3,300
Kelso	Kelso-Longview	38,530	39,500	40,100	62,700	84,200
Langley	Whidbey Airpark	14,423	20,800	28,100	33,700	39,300





TABLE 1K
GENERAL AVIATION AIRCRAFT OPERATIONS AIRCRAFT FORECASTS**

Associated City	Airport Name	2000	2005	2010	2015	2020
Lind	Lind	11,300	15,900	22,700	27,400	29,800
Lynden	Lynden	5,000	5,000	5,000	5,200	6,300
Mansfield	Mansfield	5,500	5,500	5,500	5,500	5,500
Monroe	Firstair Field	18,169	21,300	24,000	26,200	28,200
Moses Lake	Moses Lake Municipal	18,000	18,100	18,100	18,200	18,900
Ocean Shores	Ocean Shores Municipal	5,800	5,800	5,800	5,800	5,800
Odessa	Odessa Municipal	8,200	8,200	8,300	8,300	9,100
Okanogan	Okanogan Legion	4,450	4,500	4,500	4,500	4,500
Oroville	Dorothy Scott Municipal	12,600	12,600	12,700	12,700	12,800
Port Townsend	Jefferson County International	49,200	49,800	50,400	51,000	51,700
Prosser	Prosser	12,200	12,200	12,300	15,300	17,800
Roche Harbor	Roche Harbor	500	500	500	500	500
Snohomish	Harvey Field	140,240	163,700	185,100	202,700	217,900
Spanaway	Spanaway	19,330	21,900	24,800	27,100	29,100
sunnyside	Sunnyside Municipal	24,000	24,100	24,200	30,300	35,300
Tekoa	Willard Field	7,800	7,800	7,800	7,900	7,900
Twisp	Twisp Municipal	1,490	1,500	1,500	1,500	1,500
Vancouver	Fly For Fun	3,000	3,600	4,200	4,500	4,900
Warden	New Warden	7,900	7,900	7,900	8,000	8,000
Waterville	Waterville	8,500	8,500	8,600	8,600	9,200
Westport	Westport	11,400	11,400	11,500	11,500	11,600
Wilbur	Wilbur Municipal	5,700	5,700	6,000	6,000	6,000
ARC B-II						
Bremerton	Bremerton National	97,215	112,500	138,900	151,900	171,500
Burlington/ Mt. Vernon	Skagit Regional	55,132	55,800	56,400	56,600	57,300
Chewelah	Sand Canyon	7,500	7,500	7,500	7,600	8,100
Deer Park	Deer Park	30,000	33,900	37,900	41,600	44,800
Ellensburg	Bowers Field	28,728	29,400	30,000	30,200	30,800
Hoquiam	Bowerman Field	19,590	19,600	20,400	20,400	20,500
Kennewick	Vista Field	45,000	45,100	46,400	56,800	66,200
Kent	Crest Airpark	95,222	101,300	107,400	112,800	118,200
Port Angeles	Wm. R. Fairchild International	63,150	64,200	64,400	65,600	65,800





TABLE 1K
GENERAL AVIATION AIRCRAFT OPERATIONS AIRCRAFT FORECASTS**

Associated City	Airport Name	2000	2005	2010	2015	2020
Puyallup	Pierce County/Thun Field	86,710	97,900	110,700	120,900	130,900
Renton	Renton Municipal	114,568	121,800	129,500	135,700	142,300
Republic	Ferry County	3,000	3,000	3,600	3,600	4,300
Richland	Richland	19,596	19,700	20,000	24,500	29,100
Sequim	Sequim Valley	8,000	8,000	8,100	8,300	8,400
Shelton	Sanderson Field	21,676	22,200	22,700	23,200	23,700
Toledo	Toledo-Winlock Ed Carlson Mem. Field	23,625	23,700	24,400	24,500	24,600
Tonasket	Tonasket Municipal	1,050	1,100	1,100	1,100	1,100
Vancouver	Pearson Field	110,900	131,000	150,700	166,600	181,500
Wenatchee	Pangborn Memorial	58,000	58,700	59,900	60,700	61,500
ARC C-I						
Tacoma	Tacoma Narrows	51,318	57,800	65,300	71,600	77,400
ARC C-II						
South Bend	Willapa Harbor	3,050	3,100	3,100	3,900	3,900
Olympia	Olympia	53,473	69,300	84,900	98,000	110,600
ARC C-III						
Spokane	Felts Field	70,669	79,500	89,300	97,800	106,000
Pasco	Tri-Cities	69,595	70,700	71,800	72,000	73,200
Spokane	Spokane International	57,362	64,600	72,400	79,300	86,200
Bellingham	Bellingham International	78,331	79,000	79,700	80,500	97,600
Pullman/ Moscow	Pullman/Moscow Regional	51,160	51,300	52,300	52,500	53,500
Yakima	Yakima Air Terminal	48,157	48,700	48,900	49,500	49,700
ARC C-IV						
Walla Walla	Walla Walla Regional	47,077	47,500	48,300	48,800	49,300
ARC D-IV						
Seattle	Boeing Field/ King County International	298,304	317,200	336,900	353,600	370,600
ARC D-V						
Moses Lake	Grant County	115,569	115,900	117,700	118,100	120,000
Everett	Snohomish County/Paine Field	198,932	232,200	262,600	287,500	308,700
Seattle	Seattle-Tacoma International Airport	445,677	445,000	474,000	503,000	532,000

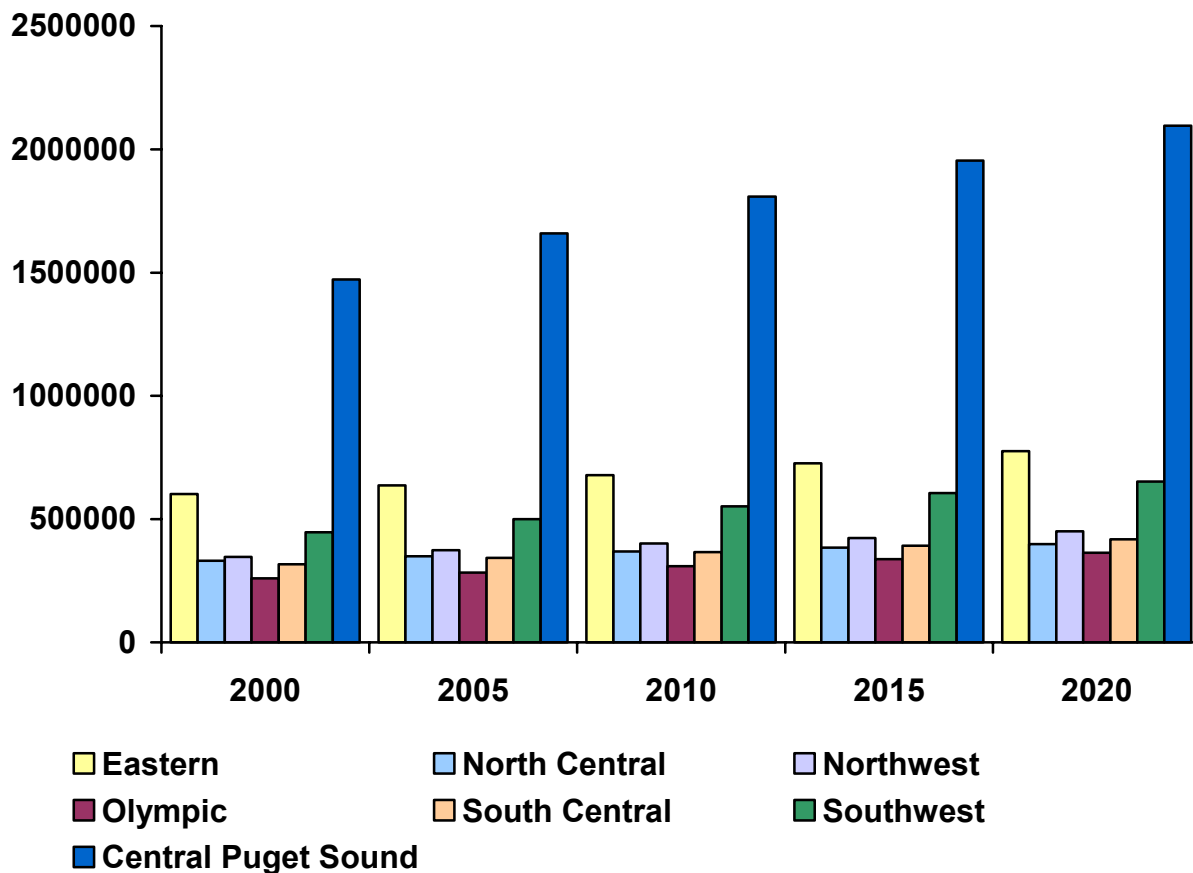
*FAA Form 5010

** Includes Air Taxi Operations





General Aviation Operations by Region





believed they should demonstrate some traffic levels even with no based aircraft. As summarized, the table indicates how operations at these airports were forecast.

Table 1L Airports with No Baseline Activity Levels WSDOT Forecast Analysis & Economic Impact Analysis Study	
<i>Airport</i>	<i>Revised Baseline Forecast Adjustment</i>
Port of Bellingham SPB	Total of 2,500 annual operations (50% local traffic / 50% itinerant) – all small planes
Bremerton SPB	Total of 2,500 annual operations (50% local traffic / 50% itinerant) – all small planes
Martin Field	Total of 2,500 annual operations (50% local traffic / 50% itinerant) – all small planes
Port Orchard	Total of 2,500 annual operations (50% local traffic / 50% itinerant) – all small planes
Roche Harbor SPB	Total of 2,500 annual operations (50% local traffic / 50% itinerant) – all small planes
Tacoma – 11 th Street Waterway SPB	Total of 2,500 annual operations (50% local traffic / 50% itinerant) – all small planes

Source: BWR revisions to WSDOT, Aviation Division airport records. (December, 2000).

FORECAST OF ANNUAL INSTRUMENT APPROACHES (AIA's)

Annual instrument approaches (AIA) for 2000 were forecast based on whether the airport had an existing published instrument approach procedure. However, for forecasting purposes in the immediate future (0-5 years) it is assumed all public-use airports in the State will have a minimum of one global positioning system (GPS) non-precision approach procedures (straight-in or circling) permitting at least Category A and B minimums. Accordingly, all system airports were forecast as having AIA's throughout the remaining planning period. As a consideration in the AIA forecast, a geographical distinction was made between portions of the State which experience significant climatological differences in instrument meteorological conditions (IMC). As shown in **Exhibit H**, The eastern slopes of the Cascade mountain range serves as the dividing line. IMC, expressed as a percent of the time this condition is experienced during an average day, is considered when cloud ceilings are below 1,000 feet above ground level and visibility is at or below three (3) statute miles. It was determined from NOAA weather station data collected from observations around the State that IMC conditions west of the Cascades occur approximately 13 percent of the time, while IMC conditions east of the Cascades occur approximately 9 percent of the time. This percent is needed to determine a forecast of actual instrument approaches.

Appendix B summarizes the annual instrument approach forecasts for each airport throughout the 20-year planning period. Since the number of instrument approaches depends heavily upon the number of pilots qualified to conduct such approaches, the percentage of IFR-rated pilots was determined. Based on information from *FAA Aerospace forecasts, Fiscal Years 2000-2011* and the FAA Airman Certification Branch, it was determined that approximately 46.1 percent of all certificated pilots are IFR-rated. Therefore, it was assumed that 46.1 percent of all general aviation operations are conducted by IFR-rated pilots. However, given the all-weather nature of commercial operations, it was also assumed that 100 percent of air taxi and air carrier operations were conducted by IFR-rated pilots. Since an operations is





defined as either a take off or landing, only half of the operations at a given airport are landings and therefore result in an approach. The number of AIA's was determined by the following formula:

$$(\text{Percent IMC} \times ((46.1\% \times \text{general aviation operations}) + \text{air taxi operations} + \text{air carrier operations}))/2$$





Percent of Time Instrument Meteorological Conditions Prevail

